

SEQUENCE LISTING

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<120> BETA1,3-N-ACETYL-D-GALACTOSAMINE TRANSFERASE PROTEIN, NUCLEIC ACID  
ENCODING THE SAME AND METHOD OF EXAMINING CANCERATION USING THE SAME

<130> 159-90 / PC/S-84-6

<140> US 10/539,450

<141> 2005-12-06

<150> PCT/JP2004/000608

<151> 2004-01-23

<150> JP 392555/2003

<151> 2003-11-21

<150> JP 285310/2003

<151> 2003-08-01

<150> JP 014792/2003

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<212> DNA

<213> Homo sapiens

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<210> 2

<211> 500

<212> PRT

<213> Homo sapiens

<400> 2

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1 5 10 15

Leu His Leu Trp Leu Arg Leu Arg Ser Pro Pro Pro Ala Cys Ala Ser

20 25 30

Gly Ala Gly Pro Ala Asp Gln Leu Ala Leu Phe Pro Gln Trp Lys Ser

35 40 45

Thr His Tyr Asp Val Val Val Gly Val Leu Ser Ala Arg Asn Asn His

50 55 60

Glu Leu Arg Asn Val Ile Arg Ser Thr Trp Met Arg His Leu Leu Gln

65 70 75 80

His Pro Thr Leu Ser Gln Arg Val Leu Val Lys Phe Ile Ile Gly Ala

85 90 95

His Gly Cys Glu Val Pro Val Glu Asp Arg Glu Asp Pro Tyr Ser Cys

100 105 110

Lys Leu Leu Asn Ile Thr Asn Pro Val Leu Asn Gln Glu Ile Glu Ala  
115 120 125

Phe Ser Leu Ser Glu Asp Thr Ser Ser Gly Leu Pro Glu Asp Arg Val  
130 135 140

Val Ser Val Ser Phe Arg Val Leu Tyr Pro Ile Val Ile Thr Ser Leu  
145 150 155 160

Gly Val Phe Tyr Asp Ala Asn Asp Val Gly Phe Gln Arg Asn Ile Thr  
165 170 175

Val Lys Leu Tyr Gln Ala Glu Gln Glu Glu Ala Leu Phe Ile Ala Arg  
180 185 190

Phe Ser Pro Pro Ser Cys Gly Val Gln Val Asn Lys Leu Trp Tyr Lys  
195 200 205

Pro Val Glu Gln Phe Ile Leu Pro Glu Ser Phe Glu Gly Thr Ile Val  
210 215 220

Trp Glu Ser Gln Asp Leu His Gly Leu Val Ser Arg Asn Leu His Lys  
225 230 235 240

Val Thr Val Asn Asp Gly Gly Gly Val Leu Arg Val Ile Thr Ala Gly  
245 250 255

Glu Gly Ala Leu Pro His Glu Phe Leu Glu Gly Val Glu Gly Val Ala  
260 265 270

Gly Gly Phe Ile Tyr Thr Ile Gln Glu Gly Asp Ala Leu Leu His Asn

275

280

285

Leu His Ser Arg Pro Gln Arg Leu Ile Asp His Ile Arg Asn Leu His

290

295

300

Glu Glu Asp Ala Leu Leu Lys Glu Glu Ser Ser Ile Tyr Asp Asp Ile

305

310

315

320

Val Phe Val Asp Val Val Asp Thr Tyr Arg Asn Val Pro Ala Lys Leu

325

330

335

Leu Asn Phe Tyr Arg Trp Thr Val Glu Thr Thr Ser Phe Asn Leu Leu

340

345

350

Leu Lys Thr Asp Asp Asp Cys Tyr Ile Asp Leu Glu Ala Val Phe Asn

355

360

365

Arg Ile Val Gln Lys Asn Leu Asp Gly Pro Asn Phe Trp Trp Gly Asn

370

375

380

Phe Arg Leu Asn Trp Ala Val Asp Arg Thr Gly Lys Trp Gln Glu Leu

385

390

395

400

Glu Tyr Pro Ser Pro Ala Tyr Pro Ala Phe Ala Cys Gly Ser Gly Tyr

405

410

415

Val Ile Ser Lys Asp Ile Val Lys Trp Leu Ala Ser Asn Ser Gly Arg

420

425

430

Leu Lys Thr Tyr Gln Gly Glu Asp Val Ser Met Gly Ile Trp Met Ala

435

440

445

Ala Ile Gly Pro Lys Arg Tyr Gln Asp Ser Leu Trp Leu Cys Glu Lys

450

455

460

Thr Cys Glu Thr Gly Met Leu Ser Ser Pro Gln Tyr Ser Pro Trp Glu

465

470

475

480

Leu Thr Glu Leu Trp Lys Leu Lys Glu Arg Cys Gly Asp Pro Cys Arg

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490

495

Cys Gln Ala Arg

500

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<211> 1515

<212> DNA

<213> Mouse

<400> 3

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tcagccttat ttctcactg gaaatttagc cactatgatg tggtagttgg tgtgttatca 180  
gctcgaaata accacgaact tcgaaatgtg ataaggaaca cctggctgaa gaatttgctg 240  
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gaagtgcctg tggaagacag ggaggatcct tactcctgcc gactgctcaa catcaccaat 360  
ccagttttga atcaagaaat tgaggcattc agctttcctg aagatgcctc ctcatctaga 420  
ctctctgaag accgagttgt cagcgtgagc ttcagagttc tctacccaat cgtgattacc 480  
agtcttggag tgttctacga tgccagtgat gttggttttc aaaggaacat cacagtcaag 540

ttgtatcaga cagagcagc ggaggccctt ttcacgccc gattcagtc tccaagttgt 600  
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 gcactgcctc atgaattcat ggaaggtgtg gagggagttg cgggtggctt tatctacact 840  
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<210> 4

<211> 504

<212> PRT

<213> Mouse

<400> 4

Met Arg Asn Trp Leu Val Leu Leu Cys Pro Cys Val Leu Gly Ala Ala

1 5 10 15

Leu His Leu Trp His Leu Trp Leu Arg Ser Pro Pro Asp Pro His Asn

20 25 30

Thr Gly Pro Ser Ala Ala Asp Gln Ser Ala Leu Phe Pro His Trp Lys

35

40

45

Phe Ser His Tyr Asp Val Val Val Gly Val Leu Ser Ala Arg Asn Asn

50

55

60

His Glu Leu Arg Asn Val Ile Arg Asn Thr Trp Leu Lys Asn Leu Leu

65

70

75

80

His His Pro Thr Leu Ser Gln Arg Val Leu Val Lys Phe Ile Ile Gly

85

90

95

Ala Arg Gly Cys Glu Val Pro Val Glu Asp Arg Glu Asp Pro Tyr Ser

100

105

110

Cys Arg Leu Leu Asn Ile Thr Asn Pro Val Leu Asn Gln Glu Ile Glu

115

120

125

Ala Phe Ser Phe Pro Glu Asp Ala Ser Ser Ser Arg Leu Ser Glu Asp

130

135

140

Arg Val Val Ser Val Ser Phe Arg Val Leu Tyr Pro Ile Val Ile Thr

145

150

155

160

Ser Leu Gly Val Phe Tyr Asp Ala Ser Asp Val Gly Phe Gln Arg Asn

165

170

175

Ile Thr Val Lys Leu Tyr Gln Thr Glu Gln Glu Glu Ala Leu Phe Ile

180

185

190



Ala Arg Phe Ser Pro Pro Ser Cys Gly Val Gln Val Asn Lys Leu Trp  
195 200 205

Tyr Lys Pro Val Glu Gln Phe Ile Leu Pro Glu Ser Phe Glu Gly Thr  
210 215 220

Ile Val Trp Glu Ser Gln Asp Leu His Gly Leu Val Ser Arg Asn Leu  
225 230 235 240

His Arg Val Thr Val Asn Asp Gly Gly Gly Val Leu Arg Val Leu Ala  
245 250 255

Ala Gly Glu Gly Ala Leu Pro His Glu Phe Met Glu Gly Val Glu Gly  
260 265 270

Val Ala Gly Gly Phe Ile Tyr Thr Val Gln Glu Gly Asp Ala Leu Leu  
275 280 285

Arg Ser Leu Tyr Ser Arg Pro Gln Arg Leu Ala Asp His Ile Gln Asp  
290 295 300

Leu Gln Val Glu Asp Ala Leu Leu Gln Glu Glu Ser Ser Val His Asp  
305 310 315 320

Asp Ile Val Phe Val Asp Val Val Asp Thr Tyr Arg Asn Val Pro Ala  
325 330 335

Lys Leu Leu Asn Phe Tyr Arg Trp Thr Val Glu Ser Thr Ser Phe Asp  
340 345 350

Leu Leu Leu Lys Thr Asp Asp Cys Tyr Ile Asp Leu Glu Ala Val

355

360

365

Phe Asn Arg Ile Ala Gln Lys Asn Leu Asp Gly Pro Asn Phe Trp Trp

370

375

380

Gly Asn Phe Arg Leu Asn Trp Ala Val Asp Arg Thr Gly Lys Trp Gln

385

390

395

400

Glu Leu Glu Tyr Pro Ser Pro Ala Tyr Pro Ala Phe Ala Cys Gly Ser

405

410

415

Gly Tyr Val Ile Ser Lys Asp Ile Val Asp Trp Leu Ala Gly Asn Ser

420

425

430

Arg Arg Leu Lys Thr Tyr Gln Gly Glu Asp Val Ser Met Gly Ile Trp

435

440

445

Met Ala Ala Ile Gly Pro Lys Arg His Gln Asp Ser Leu Trp Leu Cys

450

455

460

Glu Lys Thr Cys Glu Thr Gly Met Leu Ser Ser Pro Gln Tyr Ser Pro

465

470

475

480

Glu Glu Leu Ser Lys Leu Trp Glu Leu Lys Glu Leu Cys Gly Asp Pro

485

490

495

Cys Gln Cys Glu Ala Lys Val Arg

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<210> 5

<211> 37

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: 5' primer for PCR

<400> 5

cccaagcttg ggcctgcaga tcagttggcc ttatttc

37

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<211> 42

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: 3' primer for PCR

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aacgcggatc cgcgctgtta tcttgcttga catcgacaag ga

42

<210> 7

<211> 56

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: 5' primer for PCR

<400> 7

ggggacaagt ttgtacaaaa aagcaggcct cctgcagat cagttggcct tatttc 56

<210> 8

<211> 58

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: 3' primer for PCR

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ggggaccact ttgtacaaga aagctgggtc ctgttatcct gcttgacatc gacaagga 58

<210> 9

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Igkappa signal sequence

<400> 9

Met His Phe Gln Val Gln Ile Phe Ser Phe Leu Leu Ile Ser Ala Ser

1

5

10

15

Val Ile Met Ser Arg Gly

20

<210> 10

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: FLAG peptide

<400> 10

Asp Tyr Lys Asp Asp Asp Asp Lys

1

5

<210> 11

<211> 94

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer OT3

<400> 11

gatcatgcat tttcaagtgc agattttcag cttcctgcta atcagtgccct cagtcataat 60

gtcacgtgga gattacaagg acgacgatga caag

94

<210> 12

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer OT20

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cgggatccat gcattttcaa gtgcag

26

<210> 13

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer OT21

<400> 13

ggaattcttg tcatcgctgt ccttg

25

<210> 14

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: 5' primer for PCR

<400> 14

ggagtgttct acgatgcaa t

21

<210> 15

<211> 20

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: 3' primer for PCR

<400> 15

ctgaagcgag caatgaagag

20

<210> 16

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: TaqMan Probe

<400> 16

cactgtcaaa ctttatcagg cagaacaaga gg

32

<210> 17

<211> 37

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: 5' primer for PCR

<400> 17

cccaagcttg ggagcgcggc agatcaatca gccttat

37

<210> 18

<211> 53

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: 3' primer for PCR

<400> 18

ttttcctttt ggggccgctt ttttcctttc atcgtaacttt tgcttcacac tga

53

<210> 19

<211> 248

<212> PRT

<213> Homo sapiens

<220>

<223> b3Gal-T1

<400> 19

Phe Leu Val Ile Leu Ile Ser Thr Thr His Lys Glu Phe Asp Ala Arg

1

5

10

15



Gln Ala Ile Arg Glu Thr Trp Gly Asp Glu Asn Asn Phe Lys Gly Ile

20

25

30

Lys Ile Ala Thr Leu Phe Leu Leu Gly Lys Asn Ala Asp Pro Val Leu

35

40

45

Asn Gln Met Val Glu Gln Glu Ser Gln Ile Phe His Asp Ile Ile Val

50

55

60

Glu Asp Phe Ile Asp Ser Tyr His Asn Leu Thr Leu Lys Thr Leu Met

65

70

75

80

Gly Met Arg Trp Val Ala Thr Phe Cys Ser Lys Ala Lys Tyr Val Met

85

90

95

Lys Thr Asp Ser Asp Ile Phe Val Asn Met Asp Asn Leu Ile Tyr Lys

100

105

110

Leu Leu Lys Pro Ser Thr Lys Pro Arg Arg Arg Tyr Phe Thr Gly Tyr

115

120

125

Val Ile Asn Gly Gly Pro Ile Arg Asp Val Arg Ser Lys Trp Tyr Met

130

135

140

Pro Arg Asp Leu Tyr Pro Asp Ser Asn Tyr Pro Pro Phe Cys Ser Gly

145

150

155

160

Thr Gly Tyr Ile Phe Ser Ala Asp Val Ala Glu Leu Ile Tyr Lys Thr

165

170

175

Ser Leu His Thr Arg Leu Leu His Leu Glu Asp Val Tyr Val Gly Leu

180

185

190

Ser Leu His Thr Arg Leu Leu His Leu Glu Asp Val Tyr Val Gly Leu

195

200

205

His Trp Lys Met Ala Tyr Ser Leu Cys Arg Tyr Arg Arg Val Ile Thr

210

215

220

Val His Gln Ile Ser Pro Glu Glu Met His Arg Ile Trp Asn Asp Met

225

230

235

240

Ser Ser Lys Lys His Leu Arg Cys

245

<210> 20

<211> 271

<212> PRT

<213> Homo sapiens

<220>

<223> b3Gal-T2

<400> 20

Phe Leu Ile Leu Leu Ile Ala Ala Glu Pro Gly Gln Ile Glu Ala Arg

1

5

10

15

Arg Ala Ile Arg Gln Thr Trp Gly Asn Glu Ser Leu Ala Pro Gly Ile

20

25

30

Gln Ile Thr Arg Ile Phe Leu Leu Gly Leu Ser Ile Lys Leu Asn Gly

35

40

45

Tyr Leu Gln Arg Ala Ile Leu Glu Glu Ser Arg Gln Tyr His Asp Ile

50

55

60

Ile Gln Gln Glu Tyr Leu Asp Thr Tyr Tyr Asn Leu Thr Ile Lys Thr

65

70

75

80

Leu Met Gly Met Asn Trp Val Ala Thr Tyr Cys Pro His Ile Pro Tyr

85

90

95

Val Met Lys Thr Asp Ser Asp Met Phe Val Asn Thr Glu Tyr Leu Ile

100

105

110

Asn Lys Leu Leu Lys Pro Asp Leu Pro Pro Arg His Asn Tyr Phe Thr

115

120

125

Gly Tyr Leu Met Arg Gly Tyr Ala Pro Asn Arg Asn Lys Asp Ser Lys

130

135

140

Trp Tyr Met Pro Pro Asp Leu Tyr Pro Ser Glu Arg Tyr Pro Val Phe

145

150

155

160

Cys Ser Gly Thr Gly Tyr Val Phe Ser Gly Asp Leu Ala Glu Lys Ile

165

170

175

Phe Lys Val Ser Leu Gly Ile Arg Arg Leu His Leu Glu Asp Val Tyr

180

185

190

Val Gly Ile Cys Leu Ala Lys Leu Arg Ile Asp Pro Val Pro Pro Pro

195

200

205

Asn Glu Phe Val Phe Asn His Trp Arg Val Ser Tyr Ser Ser Cys Lys

210

215

220

Tyr Ser His Leu Ile Thr Ser His Gln Phe Gln Pro Ser Glu Leu Ile

225

230

235

240

Lys Tyr Trp Asn His Leu Gln Gln Asn Lys His Asn Ala Cys Ala Asn

245

250

255

Ala Ala Lys Glu Lys Ala Gly Arg Tyr Arg His Arg Lys Leu His

260

265

270

<210> 21

<211> 253

<212> PRT

<213> Homo sapiens

<220>

<223> b3Gal-T3

<400> 21

Phe Leu Val Ile Leu Val Thr Ser His Pro Ser Asp Val Lys Ala Arg

1

5

10

15

Gln Ala Ile Arg Val Thr Trp Gly Glu Lys Lys Ser Trp Trp Gly Tyr

20

25

30

Glu Val Leu Thr Phe Phe Leu Leu Gly Gln Glu Ala Glu Lys Glu Asp

35

40

45

Lys Met Leu Ala Leu Ser Leu Glu Asp Glu His Leu Leu Tyr Gly Asp

50

55

60

Ile Ile Arg Gln Asp Phe Leu Asp Thr Tyr Asn Asn Leu Thr Leu Lys

65

70

75

80

Thr Ile Met Ala Phe Arg Trp Val Thr Glu Phe Cys Pro Asn Ala Lys

85

90

95

Tyr Val Met Lys Thr Asp Thr Asp Val Phe Ile Asn Thr Gly Asn Leu

100

105

110

Val Lys Tyr Leu Leu Asn Leu Asn His Ser Glu Lys Phe Phe Thr Gly

115

120

125

Tyr Pro Leu Ile Asp Asn Tyr Ser Tyr Arg Gly Phe Tyr Gln Lys Thr

130

135

140

His Ile Ser Tyr Gln Glu Tyr Pro Phe Lys Val Phe Pro Pro Tyr Cys

145

150

155

160

Ser Gly Leu Gly Tyr Ile Met Ser Arg Asp Leu Val Pro Arg Ile Tyr

165

170

175

Glu Met Met Gly His Val Lys Pro Ile Lys Phe Glu Asp Val Tyr Val

180

185

190

Gly Ile Cys Leu Asn Leu Leu Lys Val Asn Ile His Ile Pro Glu Asp

195

200

205

Thr Asn Leu Phe Phe Leu Tyr Arg Ile His Leu Asp Val Cys Gln Leu

210

215

220

Arg Arg Val Ile Ala Ala His Gly Phe Ser Ser Lys Glu Ile Ile Thr

225

230

235

240

Phe Trp Gln Val Met Leu Arg Asn Thr Thr Cys His Tyr

245

250

<210> 22

<211> 253

<212> PRT

<213> Homo sapiens

<220>

<223> b3Gal-T5

<400> 22

Phe Leu Val Leu Leu Val Thr Ser Ser His Lys Gln Leu Ala Glu Arg

1

5

10

15

Met Ala Ile Arg Gln Thr Trp Gly Lys Glu Arg Met Val Lys Gly Lys

20

25

30

Gln Leu Lys Thr Phe Phe Leu Leu Gly Thr Thr Ser Ser Ala Ala Glu

35

40

45

Thr Lys Glu Val Asp Gln Glu Ser Gln Arg His Gly Asp Ile Ile Gln

50

55

60

Lys Asp Phe Leu Asp Val Tyr Tyr Asn Leu Thr Leu Lys Thr Met Met

65

70

75

80

Gly Ile Glu Trp Val His Arg Phe Cys Pro Gln Ala Ala Phe Val Met

85

90

95

Lys Thr Asp Ser Asp Met Phe Ile Asn Val Asp Tyr Leu Thr Glu Leu

100

105

110

Leu Leu Lys Lys Asn Arg Thr Thr Arg Phe Phe Thr Gly Phe Leu Lys

115

120

125

Leu Asn Glu Phe Pro Ile Arg Gln Pro Phe Ser Lys Trp Phe Val Ser

130

135

140

Lys Ser Glu Tyr Pro Trp Asp Arg Tyr Pro Pro Phe Cys Ser Gly Thr

145

150

155

160

Gly Tyr Val Phe Ser Gly Asp Val Ala Ser Gln Val Tyr Asn Val Ser

165

170

175

Lys Ser Val Pro Tyr Ile Lys Leu Glu Asp Val Phe Val Gly Leu Cys

180

185

190

Leu Glu Arg Leu Asn Ile Arg Leu Glu Glu Leu His Ser Gln Pro Thr

195

200

205

Phe Phe Pro Gly Gly Leu Arg Phe Ser Val Cys Leu Phe Arg Arg Ile  
210 215 220

Val Ala Cys His Phe Ile Lys Pro Arg Thr Leu Leu Asp Tyr Trp Gln  
225 230 235 240

Ala Leu Glu Asn Ser Arg Gly Glu Asp Cys Pro Pro Val  
245 250

<210> 23

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<212> PRT

<213> Homo sapiens

<220>

<223> b3Gal-T6

<400> 23

Phe Leu Ala Val Leu Val Ala Ser Ala Pro Arg Ala Ala Glu Arg Arg  
1 5 10 15

Ser Val Ile Arg Ser Thr Trp Leu Ala Arg Arg Gly Ala Pro Gly Asp  
20 25 30

Val Trp Ala Arg Phe Ala Val Gly Thr Ala Gly Leu Gly Ala Glu Glu  
35 40 45

Arg Arg Ala Leu Glu Arg Glu Gln Ala Arg His Gly Asp Leu Leu Leu  
50 55 60



Leu Pro Ala Leu Arg Asp Ala Tyr Glu Asn Leu Thr Ala Lys Val Leu  
65 70 75 80

Ala Met Leu Ala Trp Leu Asp Glu His Val Ala Phe Glu Phe Val Leu  
85 90 95

Lys Ala Asp Asp Asp Ser Phe Ala Arg Leu Asp Ala Leu Leu Ala Glu  
100 105 110

Leu Arg Ala Arg Glu Pro Ala Arg Arg Arg Arg Leu Tyr Trp Gly Phe  
115 120 125

Phe Ser Gly Arg Gly Arg Val Lys Pro Gly Gly Arg Trp Arg Glu Ala  
130 135 140

Ala Trp Gln Leu Cys Asp Tyr Tyr Leu Pro Tyr Ala Leu Gly Gly Gly  
145 150 155 160

Tyr Val Leu Ser Ala Asp Leu Val His Tyr Leu Arg Leu Ser Arg Asp  
165 170 175

Tyr Leu Arg Ala Trp His Ser Glu Asp Val Ser Leu Gly Ala Trp Leu  
180 185 190

Ala Pro Val Asp Val Gln Arg Glu His Asp Pro Arg Phe Asp Thr Glu  
195 200 205

Tyr Arg Ser Arg Gly Cys Ser Asn Gln Tyr Leu Val Thr His Lys Gln  
210 215 220

Ser Leu Glu Asp Met Leu Glu Lys His Ala Thr Leu Ala Arg Glu Gly  
 225 230 235 240

Arg Leu Cys Lys Arg Glu Val Gln Leu Arg Leu Ser Tyr Val Tyr Asp  
 245 250 255

Trp Ser Ala Pro Pro Ser Gln Cys Cys Gln Arg Arg Glu Gly Ile Pro  
 260 265 270

<210> 24

<211> 255

<212> PRT

<213> Homo sapiens

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<223> b3GnT2

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Phe Leu Leu Leu Ala Ile Lys Ser Leu Thr Pro His Phe Ala Arg Arg  
 1 5 10 15

Gln Ala Ile Arg Glu Ser Trp Gly Gln Glu Ser Asn Ala Gly Asn Gln  
 20 25 30

Thr Val Val Arg Val Phe Leu Leu Gly Gln Thr Pro Pro Glu Asp Asn  
 35 40 45

His Pro Asp Leu Ser Asp Met Leu Lys Phe Glu Ser Glu Lys His Gln  
 50 55 60

Asp Ile Leu Met Trp Asn Tyr Arg Asp Thr Phe Phe Asn Leu Ser Leu  
65 70 75 80

Lys Glu Val Leu Phe Leu Arg Trp Val Ser Thr Ser Cys Pro Asp Thr  
85 90 95

Glu Phe Val Phe Lys Gly Asp Asp Asp Val Phe Val Asn Thr His His  
100 105 110

Ile Leu Asn Tyr Leu Asn Ser Leu Ser Lys Thr Lys Ala Lys Asp Leu  
115 120 125

Phe Ile Gly Asp Val Ile His Asn Ala Gly Pro His Arg Asp Lys Lys  
130 135 140

Leu Lys Tyr Tyr Ile Pro Glu Val Val Tyr Ser Gly Leu Tyr Pro Pro  
145 150 155 160

Tyr Ala Gly Gly Gly Gly Phe Leu Tyr Ser Gly His Leu Ala Leu Arg  
165 170 175

Leu Tyr His Ile Thr Asp Gln Val His Leu Tyr Pro Ile Asp Asp Val  
180 185 190

Tyr Thr Gly Met Cys Leu Gln Lys Leu Gly Leu Val Pro Glu Lys His  
195 200 205

Lys Gly Phe Arg Thr Phe Asp Ile Glu Glu Lys Asn Lys Asn Asn Ile  
210 215 220

Cys Ser Tyr Val Asp Leu Met Leu Val His Ser Arg Lys Pro Gln Glu

225

230

235

240

Met Ile Asp Ile Trp Ser Gln Leu Gln Ser Ala His Leu Lys Cys

245

250

255

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Phe Leu Leu Leu Val Ile Lys Ser Ser Pro Ser Asn Tyr Val Arg Arg

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10

15

Glu Leu Leu Arg Arg Thr Trp Gly Arg Glu Arg Lys Val Arg Gly Leu

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25

30

Gln Leu Arg Leu Leu Phe Leu Val Gly Thr Ala Ser Asn Pro His Glu

35

40

45

Ala Arg Lys Val Asn Arg Leu Leu Glu Leu Glu Ala Gln Thr His Gly

50

55

60

Asp Ile Leu Gln Trp Asp Phe His Asp Ser Phe Phe Asn Leu Thr Leu

65

70

75

80

Lys Gln Val Leu Phe Leu Gln Trp Gln Glu Thr Arg Cys Ala Asn Ala

85

90

95

Ser Phe Val Leu Asn Gly Asp Asp Asp Val Phe Ala His Thr Asp Asn

100

105

110

Met Val Phe Tyr Leu Gln Asp His Asp Pro Gly Arg His Leu Phe Val

115

120

125

Gly Gln Leu Ile Gln Asn Val Gly Pro Ile Arg Ala Phe Trp Ser Lys

130

135

140

Tyr Tyr Val Pro Glu Val Val Thr Gln Asn Glu Arg Tyr Pro Pro Tyr

145

150

155

160

Cys Gly Gly Gly Gly Phe Leu Leu Ser Arg Phe Thr Ala Ala Ala Leu

165

170

175

Arg Arg Ala Ala His Val Leu Asp Ile Phe Pro Ile Asp Asp Val Phe

180

185

190

Leu Gly Met Cys Leu Glu Leu Glu Gly Leu Lys Pro Ala Ser His Ser

195

200

205

Gly Ile Arg Thr Ser Gly Val Arg Ala Pro Ser Gln His Leu Ser Ser

210

215

220

Phe Asp Pro Cys Phe Tyr Arg Asp Leu Leu Leu Val His Arg Phe Leu

225

230

235

240

Pro Tyr Glu Met Leu Leu Met Trp Asp Ala Leu Asn Gln Pro Asn Leu

245

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255

Thr Cys Gly Asn Gln Thr Gln Ile Tyr

260

265

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<211> 260

<212> PRT

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Phe Leu Leu Leu Ala Ile Lys Ser Gln Pro Gly His Val Glu Arg Arg

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Ala Ala Ile Arg Ser Thr Trp Gly Arg Val Gly Gly Trp Ala Arg Gly

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25

30

Arg Gln Leu Lys Leu Val Phe Leu Leu Gly Val Ala Gly Ser Ala Pro

35

40

45

Pro Ala Gln Leu Leu Ala Tyr Glu Ser Arg Glu Phe Asp Asp Ile Leu

50

55

60

Gln Trp Asp Phe Thr Glu Asp Phe Phe Asn Leu Thr Leu Lys Glu Leu

65

70

75

80

His Leu Gln Arg Trp Val Val Ala Ala Cys Pro Gln Ala His Phe Met

85

90

95

Leu Lys Gly Asp Asp Asp Val Phe Val His Val Pro Asn Val Leu Glu

100

105

110

Phe Leu Asp Gly Trp Asp Pro Ala Gln Asp Leu Leu Val Gly Asp Val

115

120

125

Ile Arg Gln Ala Leu Pro Asn Arg Asn Thr Lys Val Lys Tyr Phe Ile

130

135

140

Pro Pro Ser Met Tyr Arg Ala Thr His Tyr Pro Pro Tyr Ala Gly Gly

145

150

155

160

Gly Gly Tyr Val Met Ser Arg Ala Thr Val Arg Arg Leu Gln Ala Ile

165

170

175

Met Glu Asp Ala Glu Leu Phe Pro Ile Asp Asp Val Phe Val Gly Met

180

185

190

Cys Leu Arg Arg Leu Gly Leu Ser Pro Met His His Ala Gly Phe Lys

195

200

205

Thr Phe Gly Ile Arg Arg Pro Leu Asp Pro Leu Asp Pro Cys Leu Tyr

210

215

220

Arg Gly Leu Leu Leu Val His Arg Leu Ser Pro Leu Glu Met Trp Thr

225

230

235

240

Met Trp Ala Leu Val Thr Asp Glu Gly Leu Lys Cys Ala Ala Gly Pro

245

250

255

Ile Pro Gln Arg

260

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<211> 290

<212> PRT

<213> Homo sapiens

<220>

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<400> 27

Leu Leu Leu Leu Phe Val Lys Thr Ala Pro Glu Asn Tyr Asp Arg Arg

1

5

10

15

Ser Gly Ile Arg Arg Thr Trp Gly Asn Glu Asn Tyr Val Arg Ser Gln

20

25

30

Leu Asn Ala Asn Ile Lys Thr Leu Phe Ala Leu Gly Thr Pro Asn Pro

35

40

45

Leu Glu Gly Glu Glu Leu Gln Arg Lys Leu Ala Trp Glu Asp Gln Arg

50

55

60

Tyr Asn Asp Ile Ile Gln Gln Asp Phe Val Asp Ser Phe Tyr Asn Leu

65

70

75

80



Thr Leu Lys Leu Leu Met Gln Phe Ser Trp Ala Asn Thr Tyr Cys Pro

85

90

95

His Ala Lys Phe Leu Met Thr Ala Asp Asp Asp Ile Phe Ile His Met

100

105

110

Pro Asn Leu Ile Glu Tyr Leu Gln Ser Leu Glu Gln Ile Gly Val Gln

115

120

125

Asp Phe Trp Ile Gly Arg Val His Arg Gly Ala Pro Pro Ile Arg Asp

130

135

140

Lys Ser Ser Lys Tyr Tyr Val Ser Tyr Glu Met Tyr Gln Trp Pro Ala

145

150

155

160

Tyr Pro Asp Tyr Thr Ala Gly Ala Ala Tyr Val Ile Ser Gly Asp Val

165

170

175

Ala Ala Lys Val Tyr Glu Ala Ser Gln Thr Leu Asn Ser Ser Leu Tyr

180

185

190

Ile Asp Asp Val Phe Met Gly Leu Cys Ala Asn Lys Ile Gly Ile Val

195

200

205

Pro Gln Asp His Val Phe Phe Ser Gly Glu Gly Lys Thr Pro Tyr His

210

215

220

Pro Cys Ile Tyr Glu Lys Met Met Thr Ser His Gly His Leu Glu Asp

225

230

235

240

Leu Gln Asp Leu Trp Lys Asn Ala Thr Asp Pro Lys Val Lys Thr Ile

245

250

255

Ser Lys Gly Phe Phe Gly Gln Ile Tyr Cys Arg Leu Met Lys Ile Ile

260

265

270

Leu Leu Cys Lys Ile Ser Tyr Val Asp Thr Tyr Pro Cys Arg Ala Ala

275

280

285

Phe Ile

290